Some taxonomic and ecological observations on the genus *Banksiamyces*

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Abstract
The stalked cup-fungus *Banksiamyces* is reported from 13 wild and one cultivated *Banksia* species. The geographic range of *Banksiamyces* is expanded to include Western Australia, South Australia, Victoria, Tasmania and NSW. Forty-five collections of *Banksiamyces* were examined in detail for a range of macro- and micro-morphological characters. Amongst the collections were all four of the previously described *Banksiamyces* species (*B. katerinae*, *B. maccannii*, *B. macrocarpus* and *B. toomansis*). Some collections that did not accord with these taxa were assigned to *Banksiamyces* aff. *macrocarpus* and *B.* aff. *toomansis*. The two species *B. katerinae* and *B. toomansis* appeared closer than initially proposed. The strict host-specific relationship suggested by some earlier studies was not confirmed. Evidence is provided for production of the fruit-body in early spring, and production of multiple crops of the same species on the one cone over successive fruiting seasons. Apothecia of these crops are of different macroscopic appearance, with lighter apothecia being mostly immature, and darker apothecia producing spores. This phenomenon may explain previous observations of seemingly different species on the same cone. (*The Victorian Naturalist* **123** (6) 2006, 366-375)

Introduction

The fungal genus *Banksiamyces* is found growing only on cones of *Banksia*. The small, grey, cup-like fruit bodies are relatively dull and inconspicuous, and perhaps this explains the small amount of attention the fungal genus has received in comparison to the copious literature on its host (Taylor and Hopper 1991; George 1996). The genus *Banksiamyces* was erected by Beaton and Weste (1982) for *B. toomansis* and the newly described *B. katerinae* and *B. macrocarpus*; a fourth species, *B. maccannii*, was described by Beaton and Weste (1984). *Banksiamyces toomansis* was first described by Berkeley and Broome (1887), in the genus *Tympanis*, from a *Banksia* collected 'on the banks of the River Tooma' [the Tooma River rises in the Snowy Mountains of southern N.S.W. and flows into the Murray near Tintaldra]. The only other collections reported prior to the studies of Beaton and Weste (1982, 1984) were two of *Banksiamyces toomansis* (as *Encoelia toomansis*) examined by Dennis (1958a, 1958b), one on *Banksia marginata* from Victoria and one from an un-named *Banksia* from South Australia.

The fruit-body of *Banksiamyces* is an apothecium, consisting of a fertile upper surface (the hymenium), which is slightly concave or cup-like (especially when dry), with a basal stipe. The four species of *Banksiamyces* recognized by Beaton and Weste (1982, 1984) were separated on the basis of micro- and macro-morphological features of the apothecium, and each was described from a single *Banksia* host.

- *Banksiamyces macrocarpus* (on *Banksia spinulosa*) occurs on the central surfaces of follicle valves and has relatively large apothecia, dark grey in colour, and microscopically there are pigmented granular hyphae extending down the length of the stipe.
- *Banksiamyces katerinae* (on *Banksia ornata*) has tight clusters of small, dark grey apothecia on the lips of *Banksia* follicle valves, lacks pigmented granular hyphae in the stipe, and has spores which are uniformly ellipsoid.
- *Banksiamyces toomansis* (on *Banksia marginata*) has a more solitary habit, with apothecia on the central surfaces of the follicle valves, the apothecia are lighter grey, and pigmented hyphae extend only partially to the base of the stipe.
- *Banksiamyces maccannii* (on *Banksia saxicola*) has comparatively large spores and asci, and the light brown apothecia are located both at the base of the follicle valve and on the intra-follicle tissue.

Seven species of *Banksia* are recognised from Victoria: *Banksia canei*, *B. integrifolia*, *B. marginata*, *B. ornata*, *B. saxicola* (formerly included in *B. integrifolia*), *B. serrata* and *B. spinulosa* (Walsh and Entwisle 1996). Beaton and Weste (1984) noted that *Banksia canei*, *B. integrifolia* and *B. serrata* also hosted *Banksiamyces*, but the collections were sterile, and not able to be identified. Fuhrer and May (1993) mention a cone of *Banksia marginata* from South Australia on which occurred both *Banksiamyces katerinae* and *B. toomansis*, and also that an unidentified *Banksiamyces* occurs on the Queensland *Banksia conferta*, cultivated in Victoria.

Fuhrer and May (1993) considered that not only could some species of *Banksiamyces* grow on more than one *Banksia* host species, but also that more than one species of *Banksiamyces* could grow on the same *Banksia* cone. They state that most dried collections examined were sterile, but considered that 'In the absence of spores there are sufficient other distinguishing characters ... for satisfactory identification'.

Additional collections of *Banksiamyces* have accumulated at the National Herbarium of Victoria, particularly from South Australia and Western Australia, allowing further observations on the host range, species delineation, geographic range and phenology of the genus *Banksiamyces*.

Materials and Methods

Specimens held at the National Herbarium of Victoria (MEL) and the Herbarium, School of Botany, University of Melbourne (MELU) were examined. Among these collections, those that did not include sufficient data about location, the *Banksia* host, or the exact date of collection were excluded. Holotypes for *B. katerinae*, *B. macrocarpus* and *B. maccannii* also were examined, as were two of the three authentic specimens used by Beaton and Weste (1982) in their redescription of *B. toomansis*, and a paratype of *B. macrocarpus* (MEL 2022388). In total 45 collections were studied (Appendix A).

Before determining the specificity of the fungus-host relationship, fungi were identified and grouped using the morphological characters employed by Beaton and Weste (1982; 1984) in their treatment of the genus. These characters were: (1) apothecium diameter, (2) apothecium position, (3) apothecium external colour, (4) stipe length, (5) position of pigmented hyphae, (6) paraphysis shape, (7) paraphysis septate or not, (8) spores in asci uni or biseriate, (9) staining of ascus apical plugs with Melzer's Reagent (blue or not), (10) spore length, (11) spore width, (12) Q value (individual spore length divided by spore width), and (13) position of apothecia on follicle valve/intrafollicular tissue.

For each collection, macroscopic characters (1-3) were determined from dried material using a dissecting microscope before cross-sections of at least two apothecia (from at least two *Banksia* cones, where present) were placed in a weak (<5%) KOH solution and heated. These sections were examined under × 100 magnification and stipe length measured. Sections were crushed by pressure on the cover slip and surveyed at × 1000 magnification where observations were made on spores and paraphyses. Slides were then flushed with water before the addition of Melzer's Reagent to determine any staining of apical plugs. At MELU there were some existing slides of apothecia from holotypes which were already mounted in a lactophenol-cotton blue solution. Fresh mounts of apothecia from these collections were made in a weak KOH solution.

When measuring spore size a minimum of 10 spores were randomly selected. Where possible these spores were divided equally between those found within asci and those found ejected from the asci (free). A one tailed t-test assuming unequal variance was conducted to determine if spores found within asci were smaller than those found free.

Maps of the distribution of the different species were produced and compared to maps of the host range. Where possible, the identity of the *Banksia* host was checked and confirmed. Where insufficient host material existed, the host identity assigned by the collector was compared to the known range of the host species. If the two correlated then the identity assigned by the collector was accepted.

Results

Banksiamyces occurred on 14 species of *Banksia*, from southern New South Wales, Victoria, South Australia and south-western Western Australia (Appendix A). All of the *Banksia* cones appeared to be wild-collected, with the exception of one cultivated *Banksia baxteri* from Cranbourne, Victoria.

Sixteen of the 45 collections of *Banksiamyces* examined were found to be immature (without spores, or occasionally with only a few spores in asci and none free). The one collection from *Banksia menziesii* and the two collections from *B. serrata* were all immature, as were nine of the 14 collections on *B. marginata* and four of the seven from *B. spinulosa*. All collections on the remaining ten host species (*B. baxteri, B. canei, B. integrifolia, B. nutans, B. occidentalis, B. ornata, B. pulchella, B. saxicola, B. speciosa* and *B. sphaerocarpa*) were mature.

Distribution maps of *Banksiamyces* species (Fig. 1) are based on fertile specimens; among the sterile collections examined, two were from Tasmania.

Some apothecia were pale grey and some were much darker, to charcoal grey or blackish-brown. Of particular note was the relationship between the external colour of *Banksiamyces* apothecia and their maturity. Apothecia in 20 collections were light grey in colour. Of these collections, 16 had no spores present and two had spores present only in asci. By contrast, collections with charcoal grey to blackish-brown apothecia always had spores present within the asci and some spores free. There were three collections which had at least one cone on which both a cluster of light grey and a cluster of dark grey apothecia were present (MEL 2019585, MEL 2063135 and MEL 2022284) (Fig. 2). These clusters were analysed separately as far as spore characters. Once again, in comparison to darker apothecia on the same cone, light apothecia had either no spores at all, or had more spores in the asci than were free.

Spores located within asci were found to be markedly smaller than those observed floating free in the mounting medium. Across all collections, spores located within

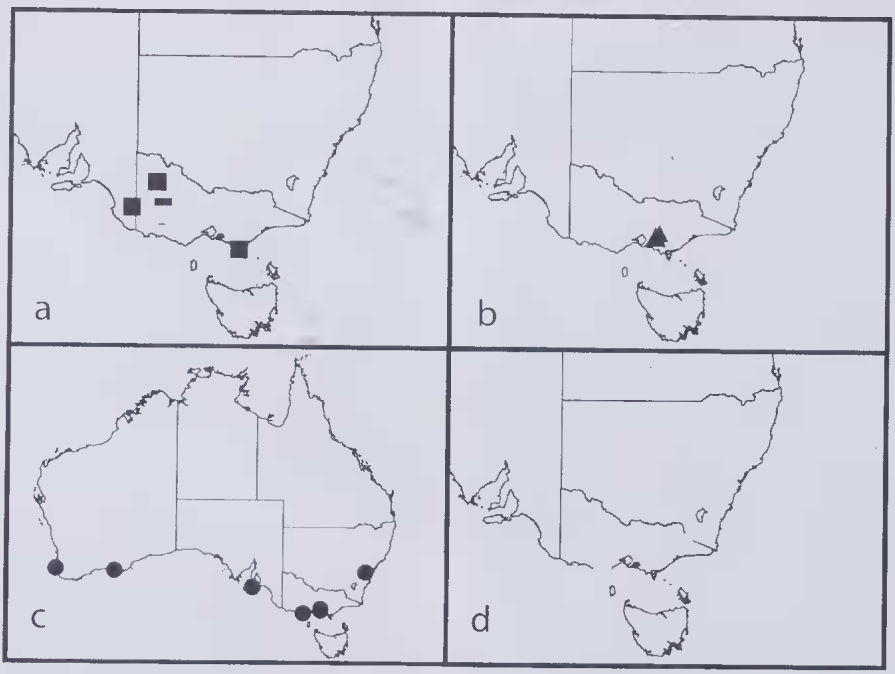

Fig. 1. Distribution of *Banksiamyces* species, based on fertile material only. **a.** *B. katerinae* (filled square) and *B. maccannii* (open square); **b.** *B. macrocarpus* (filled triangle) and *B.* aff. *macrocarpus* (open triangle); **c.** *B. toomansis*; **d.** *B.* aff. *toomansis*.

Fig. 2. Light (upper) and dark (lower) apothecia of *Banksiamyces toomansis* on the one cone of *Banksia marginata* (MEL 2019585).

asci had a mean length of 5.5 µm which were significantly shorter than free spores which had a mean length of 6.7 µm (t= -7.496, df= 401, P= 0.000). Spores within asci also had a significantly smaller width than those found free (t= -5.817, df= 401, P= 0.000). Spores found within asci had a mean width of 2.6 µm compared with free spores which had a mean width of 3.2 µm. It appears that either the spores located within asci had yet to mature to their full and final size, or the mounting medium causes swelling of the spores. For consistency, our analyses used only measurements taken from free spores.

Collections of *Banksiamyces* were made in all months, but most commonly in spring to late summer (Fig. 3). Herbarium collections do not accumulate from systematic surveys and therefore the number of collections per month is merely an indicator of collector activity. However, it is apparent that immature collections were nearly all found in late winter and spring.

Using six characters showing significant variation, collections were grouped into six taxa (Table 1), four of which corresponded to the species described by Beaton and Weste (1982; 1984), with two un-named taxa, each with affinities to one of the named taxa. Immature collections could not be identified with certainty, and the following refers only to mature collections.

All collections found on *Banksia spinulosa* were distinguished by their large apothecia diameter, long stipe and pigmented hyphae extending from the base of the hymenium to the base of the stipe. Spores were often smaller with a cylindrical shape (reflected in the higher Q value). These features, as well as the host species, accord well with the description of *Banksiamyces macrocarpus* (Beaton and Weste 1982).

Most collections found on *Banksia saxicola* had the characteristic large spores of *Banksiamyces maccannii* as described by Beaton and Weste (1984). Mean spore dimensions are quite separate from those of the other taxa (Fig. 4). These specimens were also distinguished by a lack of pigmented hyphae in the stipe.

One collection, also growing on *Banksia saxicola* (Table 1, MEL 2022131, *Banksiamyces* aff. *macrocarpus*), had far smaller spores than *Banksiamyces maccannii*, an extremely large apothecium diameter, pigmented hyphae extending to the base of the stipe and a large stipe reminiscent of *B. macrocarpus*. This collection is considered to be closest to *B. macrocar-pus*, differing in the spores which are slightly broader, and hence with a lower Q value than recorded for *B. macrocarpus*. The small number of collections of *Banksiamyces macrocarpus* from *Banksia spinulosa* available for study means that with more collections, the range of variation of spore size and shape may well extend to encompass the dimensions of spores from the *B. saxicola* collection.

Eleven collections on eight different *Banksia* hosts were assigned to *Banksiamyces toomansis*, on the basis of relatively small spore size (particularly smaller spore width), and pigmented hyphae which extended only part of the way towards the stipe base. Among the collections was one examined by Beaton and Weste (1982), from 'Chapple Vale'.

All five collections on *Banksia ornata* were consistent with *Banksiamyces katerinae* as described by Beaton and Weste (1982). Differences between *B. katerinae*

and *B. toomansis* were far subtler than the differences between *B. maccannii* and *B. macrocarpus*. *Banksiamyces katerinae* has slightly larger spores than *B. toomansis* (Table 1 and Fig. 4). However, it should be noted that the spore dimensions which we recorded for the holotype of *B. katerinae* (6.30 × 3.10 µm) also fall within the range of variation of *B. toomansis* (see Table 1). In the same way, the apothecium size of *B. katerinae* is slightly smaller than *B. toomansis*, but the two species show overlap for this character. In fact, both these species overlap for all other characters. They are both unique in being the only species to show pigmented hyphae extending only part way down the stipe and having apothecia sometimes growing on the lips of the follicle valves. On the basis of its spore width (3.60 µm), which was wider than in any of the collections of *B. toomansis*, one collection growing on *Banksia integrifolia* (MEL 2022166) was also assigned to *Banksiamyces katerinae*.

Four collections found on the cones of *Banksia marginata* and *B. canei* were assigned to *Banksiamyces* aff. *toomansis* (Appendix A, Table 1). While the spores of this group fell well within the limits of *B. toomansis*, the stipe was longer in three of the collections (3.7 to 4.5 mm, in contrast to the maximum of 2.2 mm for *B. toomansis*), and, unlike *B. toomansis*, pigmented hyphae stretched to the base of the stipe. Also in contrast to *B. toomansis*, no apothecia were observed on the lips of the seed follicle.

In identifying collections, some of the characters that were recorded appeared to vary randomly across or within collections, or showed little variation within the genus. These included paraphysis shape, whether or not paraphyses were septate, the position of the spores in the asci, and the blue staining or otherwise of apical plugs with Melzer's reagent.

The geographic range of the genus *Banksiamyces* shows a decided southern Australian bias (Fig. 1). Within the genus, *B. toomansis* appears to have the widest distribution. By contrast, *B. maccannii*, (being limited to the host *Banksia saxicola*) is restricted to the Grampians, one of the two sites in Victoria where its host *Banksia* grows (the other is Wilsons Promontory).

Discussion

Taxonomy

Six *Banksiamyces* taxa were distinguished, four of which match the species already described by Beaton and Weste (1982; 1984).

Banksiamyces maccannii and *B. macrocarpus* are well characterised by the large spores of the former and the larger apothecia of the latter, with pigmented hyphae

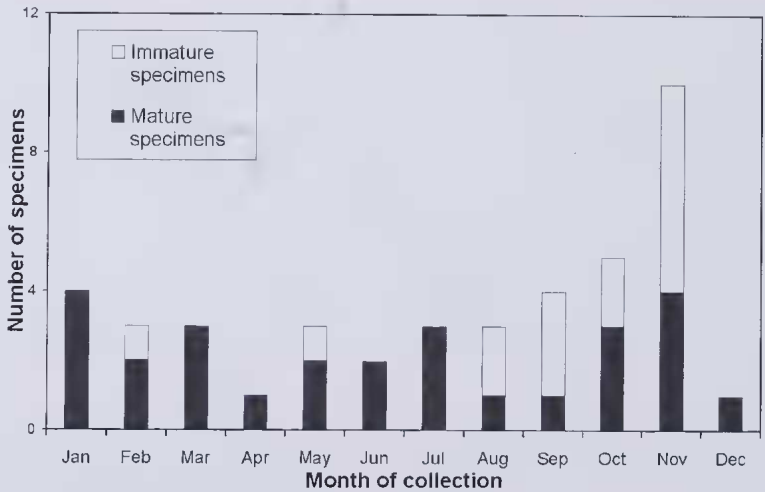

Fig. 3. Frequency distribution for month of collection of *Banksiamyces*.

Table 1. Characters separating *Banksiamyces* taxa. For measurements, the range of means across different collections is provided, followed in parentheses by the grand mean across all collections. Pigmented hyphae position: 0 = no pigmented hyphae (hyaline hyphae in gelatinous matrix), 1 = extending part way from base of hymenium towards stipe base, 2 = extending from base of hymenium to base of stipe. Apothecia position: a = on follicle valve lips, b = on base of follicle valve, c = on intra-follicle tissue.

Banksiamyces taxon	No. collections	*Banksia* host	Mean spore length × width (µm)	Mean Q (µm)	Mean apothecia diameter (mm)	Maximum stipe length (mm)	Pigmented hyphae position	Apothecia position
B. katerinae	6	*B. integrifolia* *B. ornata*	6.3-7.6 × 3.1-4.2 (6.97 × 3.73)	1.67-2.25 (1.90)	1.4-2.6 (2.04)	1.3-2.4 (1.60)	1	a, b, c
B. maccannii	4	*B. saxicola*	9.3-9.9 × 3.1-4.6 (9.54 × 4.09)	2.09-2.59 (2.39)	1.6-2.4 (2.10)	1.3-2.6 (1.75)	0	b, c
B. macrocarpus	3	*B. spinulosa*	5.0-6.3 × 1.8-2.2 (5.60 × 1.89)	2.93-3.08 (3.00)	4.3-5.1 (4.70)	5.4-12.0 (8.70)	2	b, c
B. aff. *macrocarpus*	1	*B. saxicola*	5.4 × 2.4	2.28	8.1	8.1	2	c
B. toomansis	11	*B. baxteri* *B. integrifolia* *B. marginata* *B. nutans* *B. occidentalis* *B. pulchella* *B. speciosa* *B. sphaerocarpa*	4.3-7.0 × 2.0-3.3 (5.83 × 2.78)	1.76-2.85 (2.18)	2.1-3.2 (2.56)	1.2-2.2 (1.99)	1	a, b, c
B. aff. *toomansis*	4	*B. canei* *B. marginata*	5.8-6.3 × 2.2-2.8 (6.07 × 2.50)	2.16-2.82 (2.49)	2.1-2.7 (2.38)	1.3-4.5 (3.39)	2	b, c

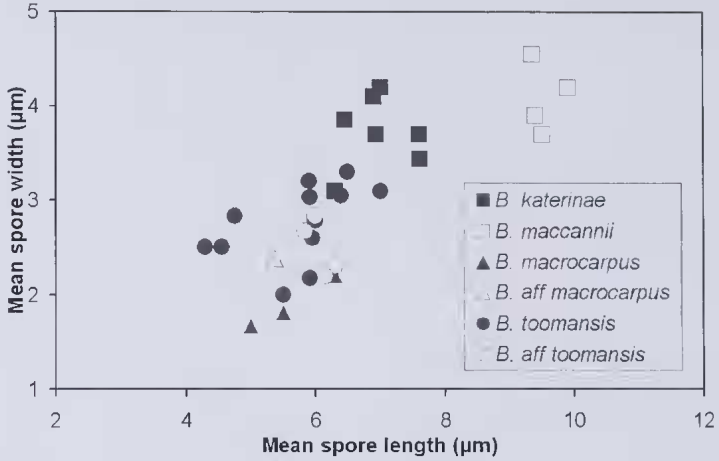

Fig. 4. Spore dimensions of *Banksiamyces* species. Each point is the mean for an individual collection, based on measurements of free spores.

extending to the base of the stipe. Each of these species is known only from one host *Banksia*. In contrast, *B. toomansis* and *B. katerinae* clearly require further analysis. The overlap between *B. toomansis* and *B. katerinae* for characters such as spore size, apothecia diameter, stipe length and pigmented hyphae position, would suggest that these two species are closer than was originally thought. While collections of *B. katerinae* generally had broader spores (as suggested by Beaton and Weste 1982), spores measured from the *B. katerinae* holotype fell well within the limits of *B. toomansis*. The separation of these two species is made even more problematic when it is considered that the spore measurements used by Beaton and Weste (1982) in their description of *B. toomansis* were taken only from spores located within the asci. Indeed when the *B. toomansis* authentic specimen was examined, no free spores could be found. We found that spores within *Banksiamyces* asci were significantly smaller than those found free. Spore measurements taken from the *B. toomansis* authentic specimen are most likely smaller than would be so for mature spores of the same specimen. Consequently, a larger spore size for the *B. toomansis* authentic specimen can be hypothesized, and this would move the species closer still towards the description of *B. katerinae*. Both *B. katerinae* and *B. toomansis* require further examination to determine their status in relation to one another. We consider that any swelling in the mounting medium would be uniform, and thus not affect the comparability of measurements from within our study. We acknowledge that further studies on the effect of maturity and mounting medium on spore size would be instructive.

Two taxa of *Banksiamyces* encountered in this investigation did not fit within the four species already described by Beaton and Weste (1982; 1984). While these taxa appear distinct, further work is required to determine if these groups warrant separation at the species level, or can be accommodated within the known species if the limits of variation of characters are expanded. For example, if collections assigned to *Banksiamyces* aff. *toomansis* were accepted as *B. toomansis*, then that species would have stipes varying from short to long and pigmented hyphae varying from extending partially to fully to the stipe base. At present, within each of the four described species, all collections have the same pattern for the extent of the pigmented hyphae in the stipe.

Several of the characters used by Beaton and Weste (1982; 1984) in their description

of the four *Banksiamyces* species did not appear to differentiate any of the species. In particular, the position of the apothecia on the *Banksia* cone may be more influenced by the structure of the cone than by some feature of the *Banksiamyces* species itself. This contention is partially supported by the observation that *Banksiamyces* are generally more common on parts of the *Banksia* follicle valves where the tomentum has eroded rather than on the hard glabrous surfaces of the cone.

Further studies on the taxonomy of the genus are required. Given the few characters which show significant variation, and the difficulty of identifying many collections due to sterility, delimitation of species would benefit from analysis of biochemical and molecular characters. If species can be grown in pure culture, cultural characters also may be of assistance.

Ecology

Banksiamyces remains known only from *Banksia*. The number of *Banksia* host species from which the fungus is known has been increased to 14. The existence of more than one species on the same host has been confirmed with the presence of *B. maccannii* and the much smaller-spored *B.* aff. *macrocarpus* on different collections of *Banksia saxicola*. The occurrence of one *Banksiamyces* species on multiple *Banksia* hosts (up to eight hosts for *Banksiamyces toomansis*), and the occurrence of more than one *Banksiamyces* species on the same *Banksia* host, demonstrates that a strict host specific relationship between *Banksia* and *Banksiamyces* does not exist at the species level. While certain groups show preference for particular hosts, *B. macrocarpus* appears to be the only species found exclusively on one *Banksia* species, and it does not share this *Banksia* host with any other *Banksiamyces* species. Even for this *Banksiamyces*, the collection assigned to *B.* aff. *macrocarpus* eventually may prove to be *B. macrocarpus*, which would then extend the host range to *Banksia saxicola*.

Amongst collections examined in this study, there were no instances of two distinct *Banksiamyces* taxa growing on the same *Banksia* cone. Nevertheless, it has been suggested that more than one species of *Banksiamyces* can grow on the one *Banksia* cone at the same time (Fuhrer and May 1993) – *B. katerinae* and *B. toomansis* on the one cone of *Banksia ornata*, and *B. toomansis* and *B. maccannii* on the one cone of *Banksia saxicola*. Fuhrer and May (1993) did not utilise spore measurements for identification of *Banksiamyces* species. Therefore, an alternative explanation is that the occurrence of two types of apothecia on the same cone reflects two different crops of the same species each from a different fruiting season (perhaps annual crops). This explanation is supported by our observations that, in general, lighter apothecia lacked spores while darker apothecia were all fertile and, in particular by observations that where a *Banksia* cone had two different types of apothecia growing on it, the lighter grey apothecia were usually immature (the new crop), whereas the spatially separate darker grey apothecia growing on the same cone were mature (possibly the previous year's crop). Dennis (1958b) noted that a collection of *Banksiamyces toomansis* from September was immature, while one from June had abundant free spores and mostly empty asci, but did not relate this to apothecium colour. Our observations suggest that apothecia colour (as far as the contrast between light grey and charcoal grey to blackish-brown) is a function of the maturity of the fruiting body rather than a basis on which to separate different species within the genus.

It is not known how long *Banksiamyces* fruit bodies persist on the *Banksia* cone. Thus the time of collection does not necessarily reflect the time of first appearance of the fruit bodies. Nevertheless, the presence of immature fruit bodies predominantly in the period from late winter to spring (August to November) does suggest that this may be the time of fruit body initiation. Longitudinal studies of *Banksiamyces* life history are required to confirm this, and would also assist greatly in determining how clusters of apothecia of different colour originate.

The collections examined expand the geographic range of *Banksiamyces* within Victoria as well as further into southern New South Wales, South Australia, Western Australia and Tasmania. On cur-

rent knowledge, *Banksiamyces* is restricted to southern Australia, although *Banksia* occurs in far north Western Australia, far north Northern Territory, and along the entire eastern seaboard to far north Queensland (Taylor and Hopper 1991; George 1996). It is interesting to note that although the distribution of known *Banksia* hosts extends substantially further north, *Banksiamyces* has yet to be found in these regions. For example, *Banksia integrifolia* extends to southern Queensland and there are populations of *B. spinulosa* as far north as the Mossman district of Queensland. Further surveys throughout the range of known hosts and of the numerous *Banksia* species on which *Banksiamyces* is yet to be found will be of interest.

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Appendix. Collections of *Banksiamyces* examined.

Herbarium no.	*Banksia* host	State	Locality	Date of Collection
Banksiamyces katerinae				
Holotype*	*ornata*	VIC	Grampians, Mt Zero	24.x.1964
MEL 2070194	*ornata*	SA	Naracoorte	29.v.1999
MEL 1054521	*ornata*	VIC	Wyperfeld, Black Flat	16.ix.1968
MEL 2022166	*integrifolia*	VIC	Wilsons Prom., Mt Oberon	9.xi.1989
MEL 2022168	*ornata*	VIC	Wyperfeld	16.vi.1961
MEL 2022184	*ornata*	VIC	Grampians, Mt Zero	24.x.1964
Banksiamyces maccannii				
Holotype*	*saxicola*	VIC	Grampians, Mt William	5.i.1984
MEL 2068724	*saxicola*	VIC	Grampians, Mt William	18.v.1975
MEL 2090368	*saxicola*	VIC	Grampians, Victoria Range	13.i.2000
MEL 2090369	*saxicola*	VIC	Grampians, Mt William	12.i.2000
Banksiamyces macrocarpus				
Holotype*	*spinulosa*	VIC	Tonimbuk	26.iv.1981
MEL 2090366	*spinulosa*	VIC	Warburton East	13.ii.2000
MEL 2022388	*spinulosa*	VIC	Beenak	9.vii.1981
Banksiamyces aff ***macrocarpus***				
MEL 2022131	*saxicola*	VIC	Grampians, Victoria Range	11.xii.1966
Banksiamyces toomansis				
Authentic *B. toomansis* 1*	*marginata*	VIC	Otways, Chapple Vale area	16.vi.1963
MEL 2090367	*integrifolia*	NSW	Blue Mountains	no date
MEL 2019585	*marginata*	SA	Kangaroo Island	18.x.1985
MEL 2022174	*marginata*	VIC	Langwarrin Flora Reserve	28.xi.1983

Appendix cont'd.

Herbarium no.	*Banksia* host	State	Locality	Date of Collection
MEL 2051421	*sphaerocarpa*	WA	12km SE Busselton	1.viii.1998
MEL 2057573	*nutans*	WA	Mt Merivale, 20km E. Esperanee	8.iii.1997
MEL 2057574	*pulchella*	WA	Mt Merivale, 20km E. Esperance	15.ii.1997
MEL 2057575	*pulchella*	WA	Mt Merivale, 20km E. Esperanee	30.iii.1997
MEL 2057576	*speciosa*	WA	Mt Merivale, 20km E. Esperance	31.i.1997
MEL 2063135	*baxteri*	VIC	Cranbourne Royal Botanie Gardens	16.vii.1995
MEL 259001	*occidentalis*	WA	Mt Merivale, 20km E. Esperance	9.iii.1997
Banksiamyces aff. ***toomansis***				
MEL 2070196	*canei*	VIC	Omeo Hwy	no date
MEL 2090370	*marginata*	VIC	Blackwood	2.vi.1991
MEL 2017890	*canei*	VIC	E. Highlands, Nunniong Plateau	13.xi.1964
MEL 2022165	*marginata*	VIC	Otway Plain, Kennedy's Creek	26.xi.1961
Banksiamyces sterile or immature eolleetions				
Authentic *B. toomansis* 2*	*marginata*	VIC	Wonga Park near Gellibrand	17.v.1965
MEL 2091608	*marginata*	VIC	Between Penola and Casterton	21.ix.2000
MEL 2101859	*spinulosa*	VIC	Wilsons Prom.	21.ii.2002
MEL 2017887	*serrata*	VIC	East Gippsland, Howe Hill	2.xi.1969
MEL 2017889	*spinulosa*	VIC	Wilsons Prom., Lilly Pilly Gully	30.ix.1973
MEL 2019581	*marginata*	VIC	Grampians, Serra Range	4.xi.1992
MEL 2022121	*marginata*	VIC	Between Bullengarook and Blackwood	8.xi.1964
MEL 2022162	*menziesii*	WA	Bullsbrook East	25.x.1977
MEL 2022164	*spinulosa*	VIC	East Gippsland, Howe Ranges	10.xi.1969
MEL 2022172	*spinulosa*	VIC	Wilsons Prom., Lilly Pilly Gully	4.xi.1980
MEL 2022173	*marginata*	VIC	Wilson's Prom., Lilly Pilly Gully	30.ix.1973
MEL 2022176	*marginata*	VIC	Wilson's Prom., Sealers Cove	30.x.1964
MEL 2022179	*marginata*	TAS	Lake St Clair, Cynthia Bay	Possibly i.1977
MEL 2022180	*marginata*	VIC	Grampians, Victoria Range	11.xi.1974
MEL 2032795	*serrata*	VIC	Dutson Downs, near Sale	22.viii.1971
MEL 227981	*marginata*	TAS	Flinders Is., Whitemark	31.viii.1991

* All types and authentie material eited are held at MELU. Colleetion details are as follows:
Holotype *B. macrocarpus* – Coll. *B. Fuhrer* (G. Beaton 418, EO 0620).
Holotype *B. maccannii* – Coll. *I. McCann* (G. Beaton 420, EO 0622).
Holotype *B. katerinae* – Coll. *K. Beaton* (G. Beaton 268, EO 0433).
Authentic speeimen *B. toomansis* 1, eited by Beaton and Weste (1982) – Coll. *G. Beaton 40* (EO 0411).
Authentic speeimen *B. toomansis* 2, eited by Beaton and Weste (1982) – Coll. *G. Beaton*, no number. Loeated in paeket with *G. Beaton 40* (EO 0411).

One Hundred Years Ago

EXCURSION TO WILSON'S PROMONTORY

Reptiles were poorly represented. The only snakes seen were Copper-heads, *Denisonia superba*, a speies also found in New South Wales and Tasmania. On opening one of those killed we found in the stomach a small lizard, *Liolepisma guichenoti*, a small frog, and two earthworms. Although I have often examined the contents of the stomach of our larger snakes this is the first instance in which I have found earthworms. All specimens were in good preservation, and had evidently been but reeently swallowed.

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